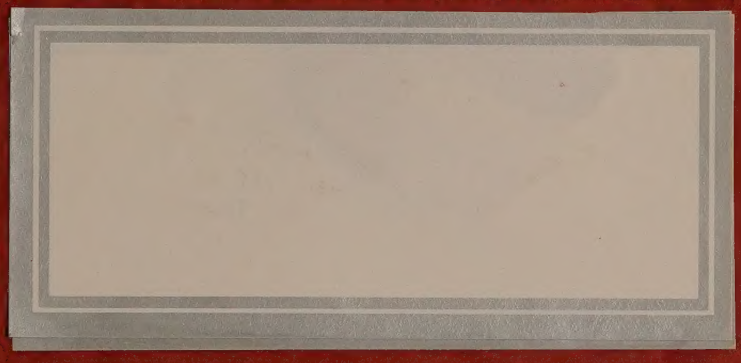
GTE-ERS
TECHNICAL LIBRARY
00903



ATLANTIC RESEARCH

TM 389TA

Price: $1.75

TM 389

TELEGRAPH POWER SUPPLY TPS-1

February 1969

Manufactured
By
ATLANTIC RESEARCH CORPORATION
TELEPRODUCTS DEPARTMENT

ALEXANDRIA, VIRGINIA 22314

USA

© THE SUSQUEHANNA CORPORATION, 1969

TABLE OF CONTENTS

Section		Page
I	GENERAL DESCRIPTION	1
II	INSTALLATION	3
III	OPERATION	5
	3-1. Controls and Indicators	5
	3-2. Current Adjustment Procedure	5
	3-3. Operating Procedure	6
IV	THEORY OF OPERATION	9
	4-1. Power Supply	9
	4-2. Current Regulator	9
	4-3. Jackfield	9
V	MAINTENANCE	11
VI	PARTS LIST	13
VII	DRAWINGS	19
	WARRANTY	25

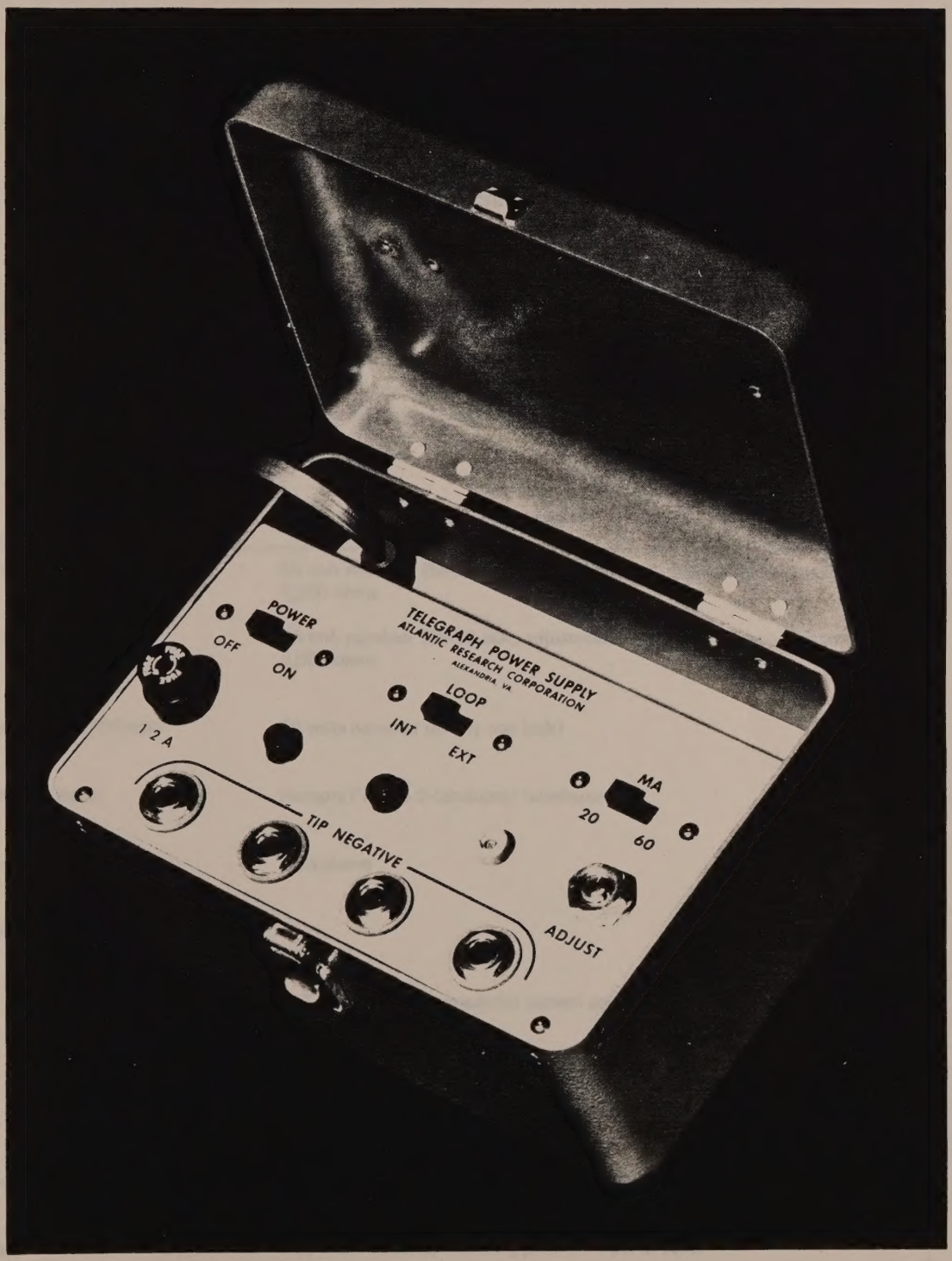


Figure 1-1. Telegraph Power Supply TPS-1.

SECTION I

GENERAL DESCRIPTION

The Telegraph Power Supply TPS-1 is a compact portable instrument which provides regulated current for unpowered neutral loops requiring 20 or 60 milliamperes. Four jacks are provided for connecting external equipment in series in the TPS output loop.

With the LOOP switch set to EXT, the four jacks may be used to connect equipment in series with an externally powered loop. The instrument provides no current regulation for the externally powered loop.

Specifications are given in Table 1-1.

Table 1-1. Specifications, TPS-1.

Loop Currents Generated:	60 mA nominal (55-70 mA, adjustable) with external loop resistance of 0 to 1,000 ohms 20 mA nominal (18-22 mA, adjustable) with external loop resistance of 0 to 3,000 ohms
Open Circuit Voltage:	70 volts nominal (in any one jack)
Type of Jacks:	Accepts PL 055 2-conductor telephone plug
Number of Series Jacks:	4 tip-sleeve
Controls	
POWER:	OFF-ON
LOOP:	INT-EXT (internal regulated current source, or external battery with external limiting)
MA:	20 or 60 milliamperes nominal
ADJUST:	Potentiometer and test points for current adjustment
Power Required:	117 volts ±10 percent, 50-60 Hz, ½ ampere
Size:	5 by 7 by 4 inches, including protective panel cover
Weight:	3.3 pounds

SECTION II

INSTALLATION

The Telegraph Power Supply TPS-1 is delivered ready for use. The TPS-1 contains no internal adjustments.

SECTION III

OPERATION

3-1. Controls and Indicators. Table 3-1 lists the controls and indicators used in the operation of the TPS-1.

Table 3-1. Controls and Indicators.

Control or Indicator	Position	Function
POWER switch	OFF	Internal dc power supply is turned off
	ON	Internal dc power supply is turned on
LOOP switch	INT	Connects regulated current source in series with output jacks CAUTION External loop must not contain a voltage source when LOOP switch is set to INT.
	EXT	Disconnects current source from output jacks to allow connection of equipment in series with externally powered loop. NOTE The TPS-1 provides no current regulation for the externally powered loop when LOOP switch is set to EXT.
MA switch	20	Sets current regulator to operate at 20 milliamperes, nominal
	60	Sets current regulator to operate at 60 milliamperes, nominal. (The current regulator may be adjusted to operate at 62.5 milliamperes when the MA switch is in the 60 position.)
Red indicator lamp		Lights to indicate instrument is receiving ac power.
ADJUST potentiometer		Used for setting current at which regulator will operate

3-2. Current Adjustment Procedure. To set the regulated current at which the TPS will operate, use the following procedure.

b. Patch load equipment and loop power source into the output jacks.

NOTE

The TPS does not regulate loop current when the LOOP switch is in the EXT position. The POWER and MA switches have no effect when the LOOP switch is in the EXT position.

SECTION IV

THEORY OF OPERATION

The Telegraph Power Supply TPS-1 contains a dc power supply circuit, a constant current regulator circuit, and four series output jacks.

4-1. Power Supply. AC power from transformer T1 is a full-wave rectified by diodes CR1 through 4 and filtered by capacitor C1. DC output voltage is approximately 70 volts.

4-2. Current Regulator. Zener diode CR5 establishes a constant reference voltage of approximately 9 volts at the base of emitter follower Q2. Q2 establishes a constant voltage across R5 (and at the base of Q1). Emitter follower Q1 maintains a constant voltage drop across the emitter resistors R2, R7, and R3. The value of loop current is determined by the total emitter circuit resistance. Loop current is controlled by operating the LOOP switch to short out R7 and by adjusting potentiometer R3.

R4 and R8 are connected in parallel with Q1 to carry most of the loop current, allowing Q1 to operate as a variable resistor to compensate for changes in external loop resistance. Thus constant current is supplied to the external loop, within the instrument rating, regardless of the external loop load.

4-3. Jack Field. The four output jacks, connected in series, allow equipment to be patched into the regulated-current loop. The jack field can be switched into a closed loop (LOOP switch on EXT), disconnecting the current regulator circuit from the output jacks. The instrument then operates as a simple series jack field with loop voltage and current externally determined.

SECTION V

MAINTENANCE

There is no routine maintenance required for the Telegraph Power Supply TPS-1.

SECTION VI

PARTS LIST

PARTS LIST

ATLANTIC RESEARCH CORPORATION

TELEPRODUCTS DIVISION ALEXANDRIA, VIRGINIA

PARTS LIST NO. 389

SHEET 1 OF 4 SHEETS

APPROVED		DATE
P.E.	[illegible]	4-30-65
CHECKED	[illegible]	4/30/65
PREPARED	R. S.	7-10-64

SUBJECT: TELEGRAPH POWER SUPPLY

TPS-1A-1 & -2

* MODEL VARIATION SEE ADDENDUM SHEET

UNLESS OTHERWISE SPECIFIED ALL REFERENCES TO COMMERCIAL TYPES, STYLES, TRADE NAMES, AND CATALOGS ARE INTENDED TO BE DESCRIPTIVE AND NOT RESTRICTIVE AND ONLY TO INDICATE THE CHARACTERISTICS OF SATISFACTORY ARTICLES.

LTR.	REVISION DESCRIPTION	DATE	APPD.	LTR.	REVISION DESCRIPTION	DATE	APPD.
A	ADDED LINES 31 & 32. LINE 26 QTY. WAS 3. LINE 28 QTY. WAS 1. LINE 23 QTY. WAS 3, PER DCN # 324	3-8-66					
B	ADDED LINE 36. LINE 31 WAS QTY 1, PER DCN # 437	10-15-66	X				
C	ADDED SHEET 4 PER DCN #445	11 28-66	X				
D	DELETED ITEM 72; ITEM 63 WAS #C12A; ITEM 12 P/N WAS TXB-C26 C37 PER DCN #644	5/22/68					

RECORD OF REVISION STATUS OF EACH SHEET

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
A	A																																							
B	B																																							
C	C		C																																					
D		D																																						

DWG. NO., PART NO., OR OTHER IDENTIFICATION	GROUP NO. AND QUANTITY 1	2	3	4	5	6	TOTAL PIECES OR QUANTITY	NOMENCLATURE	REF. DESIG.	ITEM NO.
								ASSEMBLIES, ETC.		
TP-SD-31072389	--						—	Schematic Diagram		1
TP-WD-41022389	--						—	Wiring Diagram		2
										3
										4
TP-PA-40636389	1						—	Telegraph Power Supply Final Assembly		5
										6
* TP-DA-40631389	1						1	Panel, Front, Sheets 1 and 2		7
										8
* TP-AD-40632389		1					—	Panel Assembly, Rear		9
TP-DA-40637389			1				1	Panel, Rear		10
33406				15			15	Terminal, Teflon, Press Fit, Miniature, Type ST-SM-1TUR; Sealectro Corp.		11
33740				1			1	Dissipator, Heat, Transistor Type, Type TY82R-032-037; IERC		12
										13
33781				1			1	Clip, Cable, Plastic, #834; Herman H. Smith, Inc.		14
32131				1			1	Capacitor, Fixed, Electrolytic, Tubular, 150 mfd, 150 WVDC, #BR-150-150; Cornell Dubilier Elect.	C1	15
				4			4	Diode, Silicon, Epoxy, #1N2069; Sylvania Electric Products, Inc.	CR1 thru CR4	16
32615				1			1	Diode, Regulator, Zener, 9.1V, .4 w, #1N757A; Texas Instruments, Inc.	CR5	17
30600				1			1	Resistor, Fixed, Comp., 10 ohm, ½ w, ±5%; Type GBT; International Resistance Corp.	R1	18
32836				1			1	Resistor, Fixed, WW, 1.2K, 10 w, ±1%, Type RH-10; Dale Electronics, Inc.	R4	19
30645				1			1	Resistor, Fixed, Comp., 4.7K, ½ w, ±5%; Type GBT; IRC	R5	20

#Pieces marked as such appear more than once. PIECE TOTAL AMOUNT IS SHOWN ON FIRST LISTING.

PARTS LIST

ATLANTIC RESEARCH CORPORATION

TELEPRODUCTS DIVISION ALEXANDRIA, VIRGINIA

PARTS LIST NO. 389

SHEET 2 OF 4 SHEETS

APPROVED		DATE
PE	JLW	4-30-65
CHECKED	[illegible]	4-29-65
PREPARED	R. S.	7-10-64

SUBJECT: TELEGRAPH POWER SUPPLY TPS-1A-1 (-2

* TPS-1A-1 ONLY

UNLESS OTHERWISE SPECIFIED ALL REFERENCES TO COMMERCIAL TYPES, STYLES, TRADE NAMES, AND CATALOGS ARE INTENDED TO BE DESCRIPTIVE AND NOT RESTRICTIVE AND ONLY TO INDICATE THE CHARACTERISTICS OF SATISFACTORY ARTICLES.

DWG. NO., PART NO., OR OTHER IDENTIFICATION	GROUP NO. AND QUANTITY 1	2	3	4	5	6	TOTAL PIECES OR QUANTITY	NOMENCLATURE	REF. DESIG.	ITEM NO.
30887			1				1	Resistor, Fixed, Comp., 7.5K, 2 w, ±5%, Type SR-2; IRC	R6	21
* 31038			1				1	Resistor, Fixed, WW, Silicone Coated, 300 ohm, 3 w, ±1%, Type RS-2B; Dale Electronics, Inc.	R7	22
* 31039			1				1	Resistor, Fixed, WW, Silicone Coated, 2.5K, 3 w, ±1%, Type RS-2B; Dale Electronics, Inc.	R8	23
30663			1				1	Resistor, Fixed, Comp., 27K, ½ w, ±5%, Type GBT; IRC	R9	24
30676			1				1	Resistor, Fixed, Comp., 91K, ½ w, ±5%, Type GBT; IRC	R10	25
			2				2	Screw, Machine, FH, SS, #2-56NC-2 x 5/16 Lg.		26
			2				2	Washer, Lock, Split, Brass N/P, #4		27
			3				3	Washer, Flat, SS, #6		28
			2				2	Nut, Hex., Machine, SS, #2-56NC-2		29
			2				2	Washer, Lock, Internal Tooth, #2		30
			3				3	NUT HEX MACHINE SS #6-32 NC-2		31
			1				1	SCREW MACHINE BH SS #6-32 NC-2 x 5/16 LG		32
32673			1				1	Transistor, Germanium, General Purpose, #2N2559; Texas Instruments, Inc.	Q1	33
32654			1				1	Transistor, Germanium, Swtiching, #2N398A; Texas Instruments, Inc.	Q2	34
33181			1				1	Transformer, (TP-31161X0)	T1	35
				2			2	SCREW MACHINE SS #6-32 NC-2 x LG		36
TP-AD-40634000		1					- -	Case and Cover Assembly		37
TP-DA-40633000			1				1	Case, Modified		38
33234				1			1	Case, #Z80-112A-51; Zero Mfg. Co.		39
33714				4			4	Nut, Floating, #22A27M-3240; ESNA Corp.		40
				8			8	Rivet, Button Hd., Brass N/P, 1/16 Dia., 3/32 Lg.		41
TP-40635000			1				1	Cover, Modified		42
33235				1			1	Cover, #Z80-112A-16-CF; Zero Mfg. Co.		43
33509			2				2	Hinge, Butt, Aluminum, #B-56A; Homer D. Bronson Co.		44
33752			1				1	Name Plate, TP-31007000		45
33503			1				1	Handle Assembly, Black Y-11158, 5 ¾ Lg., Polished Special Nickel Plated Steel, Style #4825; Philadelphia Handle Co.		46
33500			1				1	Latch and Clip Assembly, #340-42; Nielson Hardware Co.		47
33782			4				4	Bumper, Recessed, #2192; Herman H. Smith, Inc.		48
			4				4	Lockwasher, Internal Tooth, SS, #6		49
			2				2	Screw, Machine, Drive, SS, #0 x 1/8 Lg.		50
			4				4	Screw, Machine, BH, SS, #6-32 x 5/16 Lg.		51
			4				4	Rivet, Semi-Tubular, Truss Hd., Brass N/P, 1/32 Dia. x 1/16 Lg.		52
			4				4	Rivet, Semi-Tubular, Button Hd., Brass N/P, 1/8 Dia. x 11/32 Lg.		53
			8				8	Rivet, C'sk Hd., Semi-Tubular, Alum, 1/8 Dia. x 5/32 Lg.		54
			4				4	Nut, Hex., Machine, SS, #6-32NC-2		55

#Pieces marked as such appear more than once. PIECE TOTAL AMOUNT IS SHOWN ON FIRST LISTING.

PARTS LIST

ATLANTIC RESEARCH CORPORATION

TELEPRODUCTS DIVISION ALEXANDRIA, VIRGINIA

PARTS LIST NO. 389
SHEET 3 OF 4 SHEETS

APPROVED		DATE
PE	JLS	4-29-65
CHECKED	[illegible]	[illegible]
PREPARED	R. S.	7-10-64

SUBJECT: TELEGRAPH POWER SUPPLY

TPS-1A-1 & -2

UNLESS OTHERWISE SPECIFIED ALL REFERENCES TO COMMERCIAL TYPES, STYLES, TRADE NAMES, AND CATALOGS ARE INTENDED TO BE DESCRIPTIVE AND NOT RESTRICTIVE AND ONLY TO INDICATE THE CHARACTERISTICS OF SATISFACTORY ARTICLES.

DWG. NO., PART NO., OR OTHER IDENTIFICATION	GROUP NO. AND QUANTITY 1	2	3	4	5	6	TOTAL PIECES OR QUANTITY	NOMENCLATURE	REF. DESIG.	ITEM NO.
33008		1					1	Light, Indicator, #858-R-100K; The Sloan Company	DS1	56
33439		1					1	Terminal Strip, Tie Down Lug, #1382; Birnbach Radio Co., Inc.	TB1	57
33704		1					1	Lug, Terminal, #1415-4; Herman H. Smith, Inc.		58
33464		2					2	Standoff, #4-40 Tap, 7/8 Lg., #8160-A-0440; Amatom Co., Inc.		59
33802		1					1	Cord, Power, 18 AWG - 3 Conductor, Gray, 7 Ft. Lg., #M10771; Phalo Plastics Corp.	P1	60
33083		1					1	Fuse, ½ Amp, Type 3 AGC; Bussman Mfg. Div.	F1	61
33077		1					1	Fuseholder, Type HKP; Bussman Mfg. Div.	XF1	62
33172		4					4	Jack, Phone, #N112-A Switchcraft, Inc.	J1 thru J4	63
33175		1					1	Jack, Tip, Insulated, Black, Type 105-603; E. F. Johnson, Co.	TP2	64
33196		1					1	Jack, Tip, Insulated, Red, Type 105-602; E. F. Johnson Co.	TP1	65
30870		1					1	Resistor, Variable, WW, 200 ohm, 2 w, ±10%; Type WFRL-200; Chicago Telephone of Calif., Inc.	R3	66
30861		1					1	Resistor, Fixed, WW, 100 ohm, 2 w, ±1%, Type RS-2A; IRC	R2	67
33581		1					1	Switch, Slide, S. P.-S. T., w/Lugs, #S-110-RD; Carling Electric, Inc.	S1	68
33582		1					1	Switch, Slide, D. P.-D. T., w/Lugs, #S-316-RD; Carling Electric, Inc.	S2	69
33583		1					1	Switch, Slide, S. P.-D. T., w/Lugs, #S-112-RD; Carling Electric, Inc.	S3	70
33465		1					1	Standoff, #4-40 Tap, 2 ½ Lg., #8178-A-0440; Amatom Co., Inc.		71
										72
		7					7	Screw, Machine, BH, SS, #4-40NC-2 x 5/16 Lg.		73
		9					9	Screw, Machine, Button Hd., Socket, Blk., Anod Stl., #4-40NC-2 x ¼ Lg.		74
		1					1	Washer, Flat, SS, 3/8		75
		1					1	Washer, Lock, Internal Tooth, SS, 3/8		76
		8					8	Washer, Lock, Split, SS, #4		77
		1					1	Nut, Hex., Machine, SS, 3/8-32NEF-2 x 9/16 AF		78
		1					1	Nut, Hex., Machine, SS, 3/8-32NEF-2 x 1/2 AF		79
		6					6	Nut, Hex., Machine, SS, #4-40NC-2		80
										81
								BULK MATERIALS		
							As Req'd	Solder, Alloy 35/61.5T, 35.5L, #4L; Kester Solder		82
							As Req'd	Wire, Copper, Solid, Tinned, No. 22 AWG, Nominal O. D. .025, #298; Alpha Wire Corp.		83
							As Req'd	Insulation, Tubing, Teflon, No.20, Grade TW, #TFT-200/20; Alpha Wire Corp.		84

#Pieces marked as such appear more than once. PIECE TOTAL AMOUNT IS SHOWN ON FIRST LISTING.

PARTS LIST

ATLANTIC RESEARCH CORPORATION

TELEPRODUCTS DIVISION — ALEXANDRIA, VIRGINIA

PARTS LIST NO. 389
SHEET 4 OF 4 SHEETS

APPROVED		DATE
	[illegible]	/. . .
CHECKED	[illegible]	1/31/66
PREPARED	[illegible]	/. . .

SUBJECT: TELEGRAPH POWER SUPPLY TPS-1A

ADDENDUM TPS-1A-2

UNLESS OTHERWISE SPECIFIED ALL REFERENCES TO COMMERCIAL TYPES, STYLES, TRADE NAMES, AND CATALOGS ARE INTENDED TO BE DESCRIPTIVE AND NOT RESTRICTIVE AND ONLY TO INDICATE THE CHARACTERISTICS OF SATISFACTORY ARTICLES.

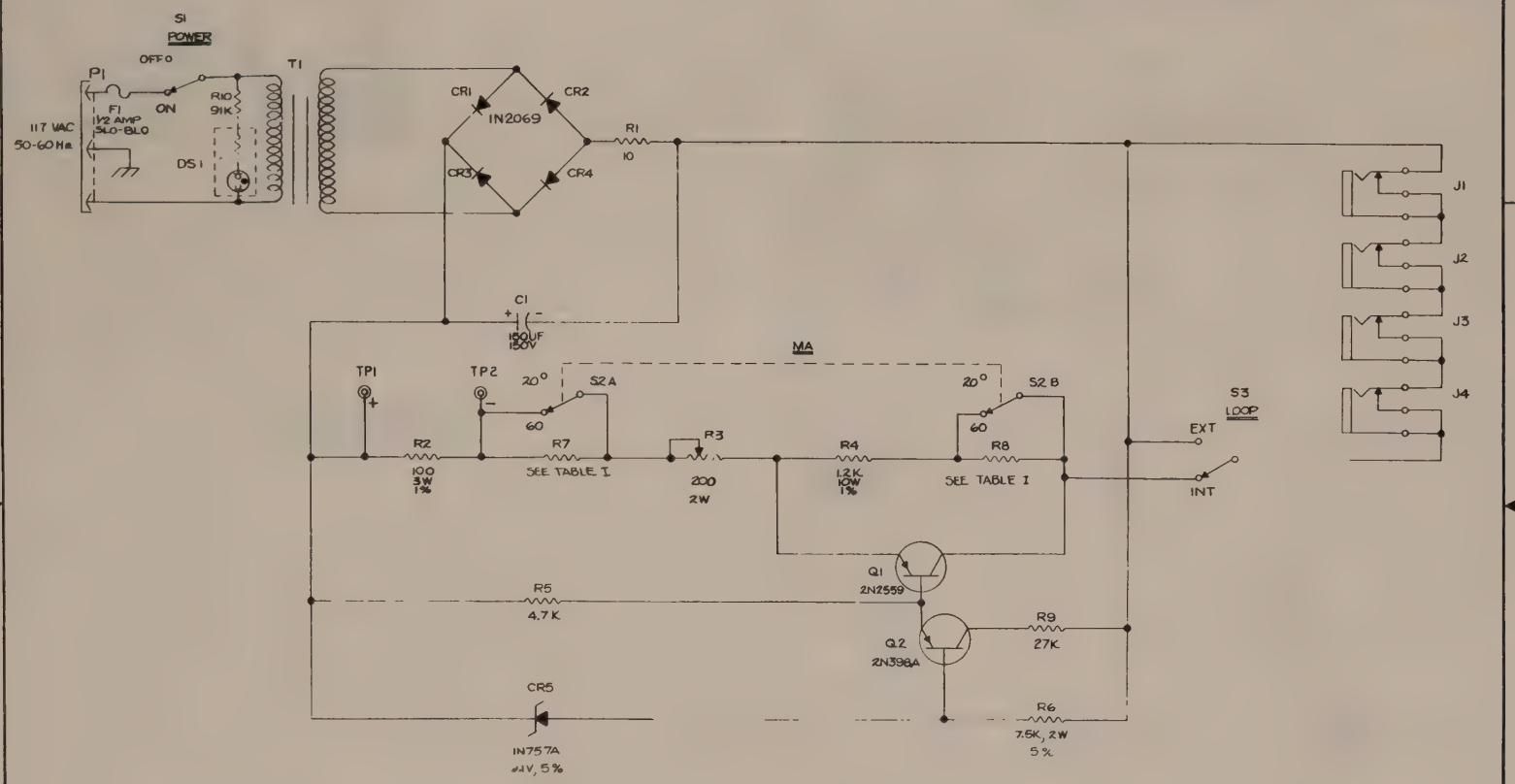
DWG. NO., PART NO., OR OTHER IDENTIFICATION	GROUP NO. AND QUANTITY 1	2	3	4	5	6	TOTAL PIECES OR QUANTITY	NOMENCLATURE	REF. DESIG.	ITEM NO.
TP-DA-40631389	1						1	Panel, Front, Sheets 1 and 3		1
										2
30429		1					1	Resistor, Fixed, Metal Film: 84.5Ω, ½W, ±1%: Type CEC (T-0): IRC	R7	3
										4
30952		1					1	Resistor, Fixed, WW, 620 Ohms, 2 W, ±5%: Type BWH:IRC	R8	5

#Pieces marked as such appear more than once. PIECE TOTAL AMOUNT IS SHOWN ON FIRST LISTING.

SECTION VII

DRAWINGS

REVISIONS					
SYM	DESCRIPTION	DATE	BY	CHK	APPD
A	ADDED NOTE 2 AND TABLE I PER DCN # 445	11-22-66	JC	EBO	



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. ALL RESISTANCE VALUES ARE IN OHMS, 1/2W, 5%.
2. SCHEMATIC AS SHOWN IS MODEL TPS1A-1

TABLE I
MODEL VARIATION

MODEL	R7	R8	OUTPUT RANGE
TPS1A-1	300Ω, 3W, 1%	2.5K, 3W, 1%	20-60 MA
TPS1A-2	845Ω, 1/2W, 1%	620Ω, 2W, 5%	30-50 MA

QTY REQD	PART OR IDENTIFYING NO	ITEM NO.	DESCRIPTION	REF DESIG	MANUFACTURER

LIST OF MATERIALS OR PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ± —
FRACTIONS ± —
2 PLACE DECIMALS ± —
3 PLACE DECIMALS ± —
SURFACE ROUGHNESS ✓
DO NOT SCALE DRAWING
MATERIAL: —

APPROVAL	BY	DATE
DRAWN	L CONG	6-8-64
CHECKED	E S Dale	9/23/65
ENGRG		
PROJ ENGRG	J. Wilder	4-30-65
STRESS		

APPROVED FOR ATLANTIC RESEARCH
NAME — DATE — 19
APPROVED
NAME — DATE — 19

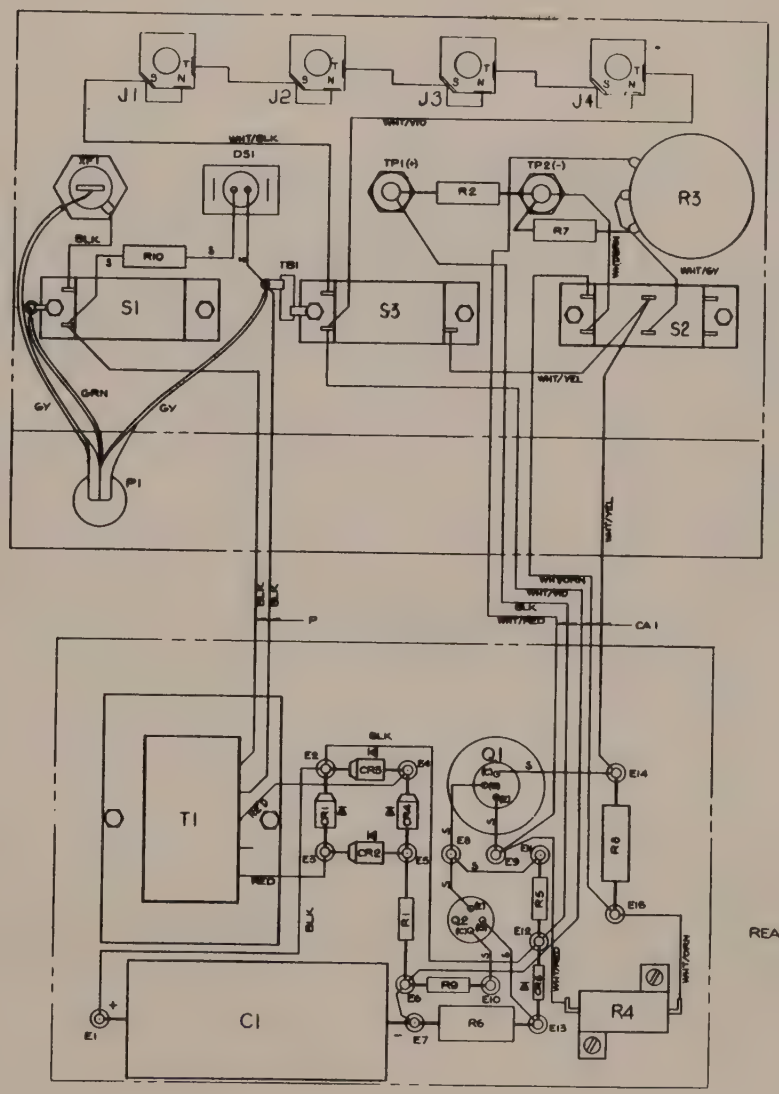
ATLANTIC RESEARCH CORP.
ALEXANDRIA, VIRGINIA

SCHEMATIC DIAGRAM
TELEGRAPH POWER SUPPLY
TPS1A

CODE IDENT NO.	SIZE		REV
95335	C	TP-SD-31072389	A LTR

SCALE — DDR NO. — SHEET —

DASH NO	NEXT ASSEMBLY	PROJECT
APPLICATION		



NOTES:
1. UNLESS OTHERWISE SPECIFIED;
   A. ALL WIRE STRAPS ARE BARE.
   B. '3' DENOTES SLEEVING (ITEM 1) OVER BARE WIRE

AR	COML	1	INSULATION, TUBING, TEFLON, CLEAR #20		
QTY REQD	PART OR IDENTIFYING NO.	ITEM NO.	DESCRIPTION	REF DESIG	MANUFACTURER

LIST OF MATERIALS OR PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES:
ANGLES ±
FRACTIONS ±
2 PLACE DECIMALS ±
3 PLACE DECIMALS ±
SURFACE ROUGHNESS
DO NOT SCALE DRAWING
MATERIAL:

	APPROVAL	BY	DATE
DRAWN		L. Lurie	4-20-65
CHECKED		[illegible]	4/22/65
ENGRG			
PROJ ENGRG		[illegible]	4-20-65
STRESS			

APPROVED FOR ATLANTIC RESEARCH 19
APPR VED 19

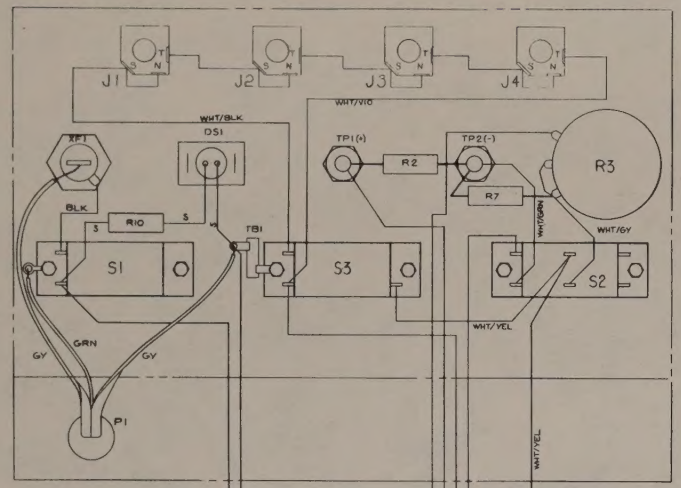
ATLANTIC RESEARCH CORPORATION
TELEPROCESSING DIVISION
ALEXANDRIA, VIRGINIA

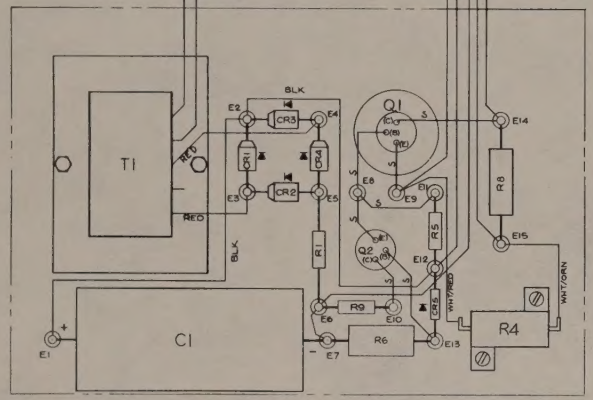
WIRING DIAGRAM
TELEGRAPH POWER SUPPLY
TPS-1A

DRAW NO.	NEXT ASSEMBLY	PROJECT
	APPLICATION	

CODE IDENT NO. 95335 | SIZE D | TP-WD-41022389 | REV -

SCALE ~ | SHEET ~





NOTES:
1. UNLESS OTHERWISE SPECIFIED;
   A. ALL WIRE STRAPS ARE BARE.
   B. 'S' DENOTES SLEEVING (ITEM 1) OVER BARE WIRE

REVISIONS					
SYM	DESCRIPTION	DATE	BY	CHK	APPD

QTY REQD	PART OR IDENTIFYING NO.	ITEM NO.	DESCRIPTION	REF DESIG	MANUFACTURER
AR	COML	1	INSULATION, TUBING, TEFLON, CLEAR #20		

LIST OF MATERIALS OR PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES ±
FRACTIONS ±
2 PLACE DECIMALS ±
3 PLACE DECIMALS ±
SURFACE ROUGHNESS

DO NOT SCALE DRAWING

MATERIAL:

APPROVAL	BY	DATE
DRAWN	L. Long	4-20-65
CHECKED	[illegible]	4/23/65
ENGNG		
PROJ ENGRG	[illegible]	4-30-65
STRESS		

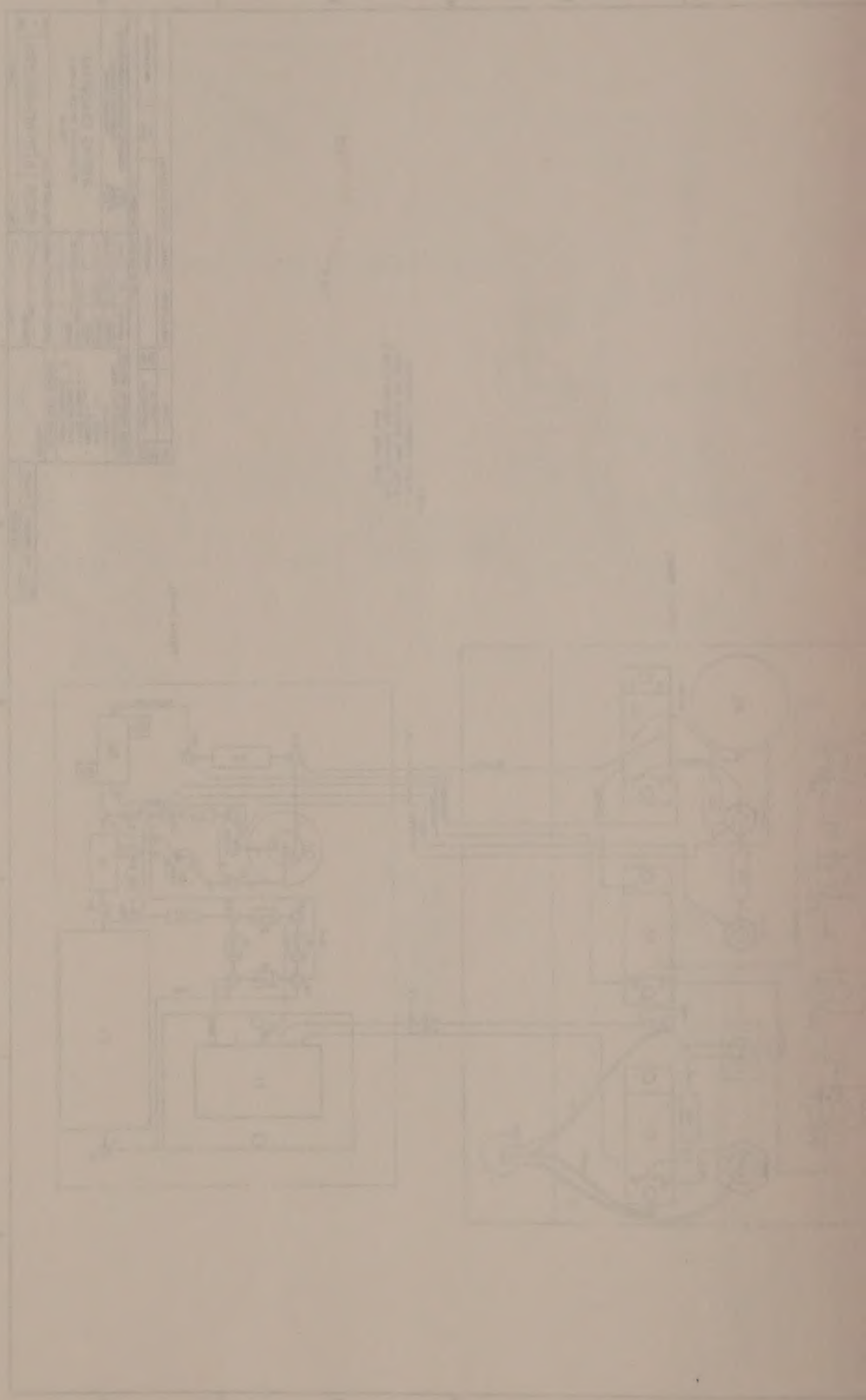
APPROVED FOR ATLANTIC RESEARCH
NAME _____ DATE _____ 19__
APPROVED
NAME _____ DATE _____ 19__

ATLANTIC RESEARCH CORPORATION
TELEPRODUCTS DIVISION
ALEXANDRIA, VIRGINIA

WIRING DIAGRAM
TELEGRAPH POWER SUPPLY
TPS-1A

DASH NO.	NEXT ASSEMBLY	PROJECT
APPLICATION		

CODE IDENT NO.	SIZE		REV
95335	D	LTP-WD-41022389	—
SCALE ~		SHEET ~	LTR



ACCOPRESS®

25970	YELLOW
25971	BLACK
25972	LIGHT BLUE
25973	DARK BLUE
25974	LIGHT GRAY
25975	LIGHT GREEN
25976	DARK GREEN
25977	TANGERINE
25978	RED
25979	EXECUTIVE RED

GENUINE PRESSBOARD

ACCO
ACCO INTERNATIONAL INC.
CHICAGO, ILLINOIS 60612

83491